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The biennial Semiconducting and Insulating Materials conference (SIMC-XIII-2004) was held in Beijing, China at the end of September. Beijing is a city of contrasts, fast becoming a modern metropolis of first-class hotels, business centres, shopping malls and wide avenues. In the Hutongs, however, ageless communities of narrow streets have changed little over the past seven hundred years.

Materials talk in China

SIMC aims to bring together researchers and engineers from academia and industry for efficient scientific exchange on the topics related to fundamental materials problems of compound semiconductors, which are widely used for electronic and optoelectronic devices.
It has been a forum for informal and friendly discussions on materials issues important for device applications.

The conference site was conveniently located in the Beijing Friendship Hotel, which is one of the largest garden-style hotels in Asia. Built in 1954, it covers an area of 335,000m^2. Its style is of classic elegance with traditional Chinese architecture and offered conference participants the opportunity to enjoy the marvellous decoration and ceremony of the 50th anniversary of the hotel complex.

Conference participants from 17 countries presented over 100 papers (15 invited talks, 39 oral and 48 poster presentations) and industrial equipment developments were also presented, as with Riber's MBE product range application and process technology.

Wide- and narrow-band and semi-insulating

The scientific programme represented almost all classes of compound semiconductors: wide bandgap materials (SiC, ZnO, GaN and III-N alloys) and narrow-bandgap nitrides (GaNAs) and the semi-insulating III-V materials.

Nanomaterials and technologies as well as materials characterisation and devices were also well presented.

The achievements in the field of spintronics (ferromagnetic semiconductor materials) were demonstrated in one invited talk and several other contributions.

All presented results were 'hot' and the innovative flavour of all the presentations were impressive.

Highly mismatched III-Vs alloys are formed when metallic (electronegative) ions are partly substituted by more electronegative (metallic) isoelectronic atoms.

The most intensively studied of such alloys are mastered by incorporation of small amount of N in GaAs or GaInAs.

The striking feature of these alloys is a large reduction of the fundamental band gap with increasing N content.

The alloys found extensive applications for optoelectronic devices. They could also be operated to utilise the near infrared part of the solar spectrum in multijunction solar cells.

Quantum well IR photodetectors allow detection of photons in the range of 3 to 20μm. Intersubband transitions in the conduction band of AlGaAs/GaAs are used.

Thermal imaging at high thermal and position resolution allows the detection of cancerous tissue. Dynamical infrared imaging is now opening new possibilities for tumour identification.

China's encapsulation

The last talk of the conference was full of brightness. Here Chinese scientists reported on and demonstrated a new encapsulation method: Power Top LED can enhance the intensity of LEDs by 40% more than a traditional Top LED.

During the conference the members of the International Advisory Committee discussed the change of members in the committee, and the topics and site for the next conference. Prof. David Look, Zhaoqiang Fang and Bruce Claflin in the Semiconductor Research Center, Wright State University, Dayton OH are working together to arrange the 14th Semiconducting and Insulating Materials conference in 2006. The most probably date is June and the conference will be held in Dayton or Cincinnati, Ohio.

The picture which decorated all published materials at the conference contains typical symbols of Chinese history and traditions and its future. These are the Great Wall of more than 2000 years; stone lion, symbol of power, stand in pairs on each side of main gates of important buildings; the elliptical construction with a needle, built in 2000 is called "century temple" and is now the important celebration meetings with thousands of people arranged here, rather than Tian An Men Square and its symbolism. Between the Great Wall and the stone lion lie highway and cross roads, symbols of modern life Beijing, today.